Japanese Patent Application Kokai No.64-71437
Published: March 16, 1989
Patent Application No. 62-225350
Filed: September 10, 1987
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1. Title of the invention: Method of preserving raw meat

2. Claims:

1. Method of storing raw meat characterized by putting raw meat into a substantially gas-permeable container together with an oxygen-generating agent contained in an oxygen-permeable package, sealing the container and preserving in a refrigerator or in a frozen condition.

3. Detailed description of the invention

(Field of industrial utilization)

The present invention relates to a method of storing raw meat and more particularly to a method of preserving the red color which is a measure of freshness of the raw meat by utilizing an oxygen- generating agent.

(Prior art)

In general, fresh red color of meat is sought for as well as its taste and the price of meat is mostly decided taking these factors into consideration.

However, although meat of livestock or fish right after production assumes a bright red color, but during their storage the color of the meat turns toward brown color in the conventional cold storage, losing the bright red color inherent to the red meat or turning into brown color, resulting in reduction of the value as merchandize.

As one of the conventional methods to preserve the red color of meat, there is a method using nitrate as coloring agent but this was not desirable because a chemical substance is added to foodstuff.

As one effective method of preserving the red color of raw meat, a method of storing the raw meat in an atmosphere having a high concentration of oxygen was publicly proposed (Tokai Area Fishery Products Laboratory, "The 21st Communication Materials for Utilization, Processing and Testing of Fishery Products", page 14).

However, this method has defects in that it requires an oxygen cylinder, gas filling and packaging machines, as well s a highly professional skill in and knowledge on operations of the machine and the oxygen cylinder.

(Problems to be solved by the invention)

Under the situation, the present invention provides a method for storing meat by forming an atmosphere of a high oxygen concentration to preserve the red color of raw meat with a simple method, without requiring any special machine or professional skill or knowledge.

(Means for solving the problem)

The present inventors have found that the red color of raw meat can be preserved by enclosing it in a sealed container together with a package containing an oxygen-generating agent and thus has completed the present invention. That is, the present invention provides a method for storing raw meat characterized by putting raw meat into a substantially gas-permeable container together with an oxygen-generating agent contained in an oxygen- permeable package, sealing the container and storing it in a refrigerator or in a frozen condition.

In the present invention, the term "oxygen-generating agent" means a composition which can generate oxygen. For example, a composition capable of generating oxygen while conducting chemical change may be cited. More particularly, a composition containing as main effective components peroxide or salt of peroxide, catalyst added if necessary, and water added just prior to use or water-retaining material for retaining water content.

In this case, as peroxide or peroxide salt, hydrogen peroxide, peroxide salt such as potassium percarbonate and sodium percarbonate; or perborate salt such as sodium perborate or potassium perborate may be cided.

As catalyst, metal oxide such as iron oxide, manganese dioxide; or enzyme such as catalase may be cited. However, the materials are not particularly restricted if they effectively function to decompose the peroxides or peroxide metal salts.

As composition for the oxygen-generating agent constituting the oxygen-generating package, catalyst added, if necessary, is 0.1 -10, preferably 0.5- 2, most preferably 0.2-5 parts by weight per one part of the compound which substantially generates oxygen. Further, the oxygen concentration within the container after completion of oxygen generation is preferably from 40 to less than 100%, more preferably 50-90 %.

In the present invention, the oxygen-generating agent is used as a package of an oxygen-generating agent in a gas-permeable packaging bag. As the packaging material used for the gas-permeable packaging bag, gas-permeable single or laminate film or sheet formed from porous plastic film, non-porous oxygen-enriched film, paper, cloth, non-woven cloth, etc. alone or in combination may be cited.

In order for the oxygen-generating compound to be decomposed or reacted to substantially generate oxygen which is contained in the package of oxygen-generating agent proposed by the present invention, the presence of water or moisture is indispensable. However, there is a practical problem if the water is contained beforehand in the package of oxygen-generating agent in that the storage life of the package of the oxygen-generating agent is extremely shortened. In the present invention, water or moisture is not contained beforehand in the package of oxygen-generating agent but is supplied right prior to the use of the package of oxygen-generating agent. As method for supplying water or water content, direct injection of water with means such as injection syringe or feed of water through a

packaging bag from outside of the package may be cited and there is no special restriction if it can effectively supply water or moisture. The amount of water to be supplied is preferably 0.1-10, more preferably, 0.5-5 parts by weight per one part by weight of the water-generating compound.

In the present invention, the meat is not particularly restricted and may include chicken, pork, beef or other meat of livestock, tuna or skipjack tuna or other fish.

In the present invention, as materials for the substantially gas-impermeable container, those having an oxygen permeability less than 100 $ml/m^2 \cdot atm \cdot$ day (at 20℃) are preferred. For example, a laminate film of polyvinylidene chloride film or polyvinyl chloride laminated on a film of another material is conveniently used. More desirable film from the standpoint of strength is that which has been biaxially stretched or which has been biaxially stretched and further laminated.

The sealing of the non-gas permeable film is effected using the conventional heat sealing method but other sealing tools may be used. Further, as the non-permeable container used in the present invention, a gas-tight container may be used. Such gas-tight container may be desirably comprised of heat-sealable plastic tray and a lid in which the sealing of the lid is effected by using a gas-impermeable film, or a plastic or metallic container. The shape of such container is not particularly restricted so long as the function of the oxygen-generating agent is not precluded.

In this manner, the raw meat sealed in the gas-impervious container together with the oxygen-generating agent is stored in a cold or freezing condition, whereby turning of the bright red color inherent to the raw meat to brown color is remarkably suppressed.

(Function)

According to the method of the present invention, the oxygen concentration is remarkably enhanced by the oxygen-generating agent, with a result that the red color of meat is preserved through the interaction of the raw meat and the oxygen, and turning of the color to brown is prevented in corporation with the cold storage or refrigeration.

(Example)

Example 1

After refrigeration, sliced pieces of 50 g half-thawed tuna fish were arranged in a plastic tray which is in turn put in a gas-impervious KON/PE packaging material (150mmx20mm square dish) together with a package of an oxygen-generating agent consisting of 2g of sodium percarbonate, 3g of iron oxide and 2g of dry pulp in a gas-permeable packaging material, and then 120 ml of air was sealed therein, and the assembly was sealed and stored at 5℃. The oxygen-generating agent was sealed. The

oxygen-generating agent was used after 5g of water had been supplied.

The oxygen concentration at the start was 21 %.

The oxygen concentration after one day of storage was measured and the color of the raw meat was observed. The result is shown in Table 1.

Comparative Example 1

Example 1 was repeated except that an oxygen-absorbent package ("AGELESS SS-50, deoxidant manufactured by Mitsubishi Gas Chemical K.K.) was used and test, measurement and observation were effected similarly to Example1. The results are shown in Table 1 along with those of Example 1.

Comparative Example 2

Example 1 was repeated except that the package of oxygen-generating agent was not used and the test, measurement and observation were effected similarly to Example 1. The results are shown in Table 1 along with Example 1.

Table 1

	Oxygen concentration	Color evaluation of raw meat
Example 1	70%	good
Comp. Example 1	less than 0.01%	rather bad
Comp. Example 2	2.0%	bad

(Effect of the invention)

According to the present invention, by containing an atmosphere of a high oxygen concentration in a sealed container, a high concentration oxygen atmosphere can be formed without requiring any special machine or professional skill or knowledge such as oxygen cylinder or gas-filling and packaging machines, and raw meat can be stored while preserving the color of raw meat in a simple manner.